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Why aren't you using it yet?
Greetings From Your President ........................ Michael Glassow ........................ 3

HAPS 2003—Philadelphia, Pennsylvania ................. 4
Lakshmi Achirela, Ph. D. .......................... 4

The Cutting Edge ........................................ 6
The Ubiquity of Cu2+ ................................. 6
Kenneth S. Stauffer ................................. 6

Educational Issues ....................................... 7
Umbrela Corsi and Middle Winners—Amazing Malagropes of AAP ........................ 7
Roberta Meekhun and Kenneth S. Saldarriaga ........................... 7

Teaching Tips ............................................ 10
Tips for Teaching Muscle Labs ......................... 10
Swan J. Mitchell, Ph.D. ............................. 10

Novel Activities for Morphology Laboratories: Activities for Use Within a Single Class Session .............................. 11
Nina Zanetti ................................. 11

HAPS Committee Reports .............................. 13
The Intended Learning Outcomes Project ................. 13
Murray Jensen, Co-Chair of the HAPS Core Curriculum and Assessment Committee .......................... 13

Learning Outcomes Statements ....................... 16
Charles R. Wert, Co-Chair of the HAPS Core Curriculum and Assessment Committee ........................ 16

E lecting the Leadership ................................ 19
PhD Tate, HAPS President Elect ........................ 19

Regional Conference Committee ...................... 20
Mary Bruckner, Chair ............................... 20

HAPS@Anne Arundel College Community .................. 22
Richard Faircloth, Ph.D. ............................ 22

HAPS 2002 Annual Conference in Review ....... 24
Annual HAPS Conference—After the Fact .......... 24

Summary of Workshop 101: Diabetes Research News That Keeps A&P Students Interested .............. 25
Mary Lou Percy ............................... 25

Summary of Workshop 403: Uncovering “Misconceptions” Can Help You to Help the Learner to Learn ............... 25

Summary of Workshop 201: Search, Explore, and Share: Outline Portals to Enhanced Teaching and Learning ............... 26
James Janicki, Ph. D. ............................. 26

Summary of Workshop 201: Critical Thinking: Yes It is So Important, Why Don’t We Teach It? ........................ 26
Dayton J. Food, Ph.D. ........................... 26

HAPS-EDucator - Winter 2003 - page 1
Hello again. I would like to take this opportunity to share a few examples of what your Executive Committee and Board of Directors have been up to since you last heard from us.

The Board has chosen to continue our movement toward online operations as a way to curb publication and mailing costs. Plans for production and mailing of hard copies of an updated Membership Directory have been scrapped in favor of an online version that is always current. We understand that some will still prefer to have a hard copy of the Membership Directory, so the capability will exist for anyone desiring one to download the Directory as a PDF file and to print a personal copy.

This is but one of many improvements to hapsweb.org that presently being developed by YTZ Tech. I urge you to examine some of these developing features right away. Just go to the site and login with username = demo, password = demo. You will be able to examine many of the site's features, but you will be unable to alter anything. Soon you will use your email address as your user name along with a password that you will be able to designate for yourself. From then on, you will be able to update your personal information in the Membership Directory, effectively ensuring that the Directory remains current in real time! You will be notified by email when that time comes.

A Member Registration system will also be available through hapsweb.org. It will allow HAPS members to renew their membership online using an e-commerce system. This secure system will allow each member to pay membership dues with a credit card or via electronic check, and it will also permit members, non-members, and vendors to register electronically for Annual and Regional Conferences. Depending upon logistical decisions made by the respective conference coordinators, hapsweb.org may also be used to enroll participants in special events, workshops, day trips, etc.

On a financial note, early review of the HAPS budget's projected expenses this year indicate that we will require extraordinary efforts to manage our finances prudently. Therefore, the Board approved the Treasurer's recommendation to authorize the transfer of HAPS funds from accounts that bear management fees without paying interest or dividends to a combination of accounts and certificates of deposit. The plan is structured to cut financial management costs while improving the balance between income and liquidity of funds. We are grateful to the staff of OSG for their help in finding alternative financial instruments that allow this flexibility.

I am pleased to share with you that HAPS has made further progress in establishing affiliations with other related professional organizations, and Past President Bill Perotti has assumed the role of overseeing these ongoing relationships. Christine Bilis has agreed to serve as Liaison between HAPS and the American Association of Anatomists (AAA) while Karen McMahon is serving in that capacity with the Association of Biology Laboratory Educators (ABLE), and Mary Bracken is Liaison to the National Association of Biology Teachers (NABT). President Emeritus Chris Martin represents HAPS at the American Institute of Biological Sciences (AIBS); Rob Carroll and Dee Silverthorn do so with the American Physiological Society (APS).

Should you have any question as to the importance of these relationships, I ask you to recall the urgent email you received this fall notifying you of Congressional plans to eliminate certain funds for biological research and offering you the opportunity to sign a petition in opposition to those cuts. There is no way to know how many members of HAPS signed that electronic petition, but the overall result was to increase the budget for biological sciences research. It was a significant victory made possible by the joining of forces to preserve the interests of biologists. There may come a time when HAPS will need to call upon our collegiate organizations in a similar way to get help with some of our own interests.

I would like to close with a final note about the 2003 Annual Conference in Philadelphia. Attendance at the Annual Conference is one of the best ways that any member can support the organization and benefit most from membership. As usual, there will be many fine update seminars, poster sessions, discussions, workshops, and vendor demonstrations to boost your professional development. Also, and perhaps most rewarding of all, there will be the usual abundance of opportunities to share some wonderful experiences with colleagues you may see only during that annual occasion. The Wyndham Hotel promises to be an elegant experience and a great environment for socializing with colleagues while attending the meetings. Conference Coordinator Lakshmi Atchison has tapped into the experiences of “old hands” at conference planning such as Phil Tidie, Karen LaFleur, and Henry Jusczyn to arrange a “Time to Chime” that should easily live up to its billing! Please plan to attend and stay in the Wyndham. That is the best way to benefit fully from the time with your fellow “HAPsters.”

In the meantime, stay healthy and warm!

Michael Glasgow, HAPS President

HAPS-EDucator Winter 2003 - page 3
As we approach the year 2003, the countdown will begin and it will be a 'Ting to Chime!' In organizing this conference, the planning committee and I have tried to follow the footsteps of many previous conference planning committees to put together a great conference package. We hope that you will enjoy the Philadelphia experience. Many exciting HAPS events are being planned, and Chestnut Hill College, your host institution, is waiting to welcome you to the home of Libertas Bell and its history. Chestnut Hill.

Meanwhile, Dr. Michael—Bad to the Bone—Achison (a.k.a. Dr. Blues) is organizing the live band (Triage) for the conference banquet. The band hopes to provide a night of fun, music, and dancing. Be prepared to sing "The Biochemistry Man Blues."

Chestnut City is just the beginning of the Philadelphia experience. It provides plenty of opportunity for visitors to stroll along and enjoy the sights. Once there, you will find that Philadelphia is only a walker's paradise. Whether you travel by horse and carriage, sightseeing cruise, bus or trolley, regional or hi-speed trains, there are many ways to get acquainted with this multifaceted city. The city of Philadelphia is arranged in 5 main squares: Penn Square, Washington Square, Rittenhouse Square, Logan Square, and Franklin Square. Tours are offered for museums, architecture, art galleries, theaters, shopping malls, colleges or university campuses, parks, zoo, opera or musical theaters, and a variety of cuisines. In addition, there are other attractions throughout the Pennsylvania countryside. The central agency for information about Philadelphia is the Philadelphia Convention and Visitors Bureau (PCVB). The PCVB offers a variety of free literature and personalized itineraries mailed out by a friendly staff. For more information about PCVB, please visit their website at www.pcvb.org.

Center City, the local name for the downtown area, is bordered by the Delaware River to the east, Schuylkill River to the west, Vine Street to the north, and South Street to the South. The Center City's 1,280 acres are a blend of great sights, great sounds, and a variety of tastes. Therefore, there is no better way to experience Philadelphia than to walk through the streets of this"city of neighborhoods" and "city of brotherly love."

Getting to Philadelphia by air

The Philadelphia International Airport is eight miles from Center City and is served by all major domestic carriers, with flights to more than 100 cities in the United States. One-way cab fare to and from Center City is about $20.00. The SEPTA R-1 regional rail line connects the airport with Center City and includes stops at 30th Street Station (Amtrak) and suburban stations at 15th and Market East at 11th St. (The Wyomissing Franklin Plaza at 17th and Race Sts.) For Philadelphia International Airport information, call 800-PHL-GATE or visit their website at www.phl.org. The airport website also provides information regarding parking, car rentals, and currency exchange.

Some interesting highlights to visit


For art enthusiasts, there are The Philadelphia Museum of Art, The Rodin Museum, and The Pennsylvania Academy of the Fine Arts.

Shopping lovers who are looking for bargains can browse through shops along Antique Row for antiques, Jewelers Row for baubles large and small, Old City for art gallery treasures, South Street for eclectic wares, and Liberty Place and King of Prussia Mall for the latest clothes, all without spending a penny in sales tax! If you have time, the Franklin Mills Mall and the Outlet malls in Reading are accessible by car and bus.

The history lover can journey back in time to the city's Revolutionary era by crossing the threshold into historic Philadelphia, viewing the Liberty Bell, Independence Hall Franklin Court, the Betsy Ross House, and Independence National Historic Park for a true slice of America.

Interested in a bike tour? For those who are interested in a jogging, biking, hiking and sight seeing, Fairmount Park, the nation's largest landscaped city park, is located northwest of Chestnut Hill College, Philadelphia, Pennsylvania.
City. The park encompasses more than 8,900 acres of land with winding creeks, rustic trails, lush green meadows, and 100 miles of jogging, bike, and bridle paths perfect for exploration, sightseeing and sports. The park also has the finest group of authentic early American 18th and 19th century historical houses in the nation for touring. Other attractions in the park include the Waterworks, Philadelphia Museum of Art, Bouthouse Row, the Horticultural Center, the Japanese House and Garden, and the Philadelphia Zoo.

When your thoughts turn to food, everything you have heard about Philadelphia is true! You will find casual corner eateries to luxurious four-star establishments. A must see place is the Reading Terminal Market and the Italian Market for the freshest produce and meats. Philadelphia is also best noted for international cuisines: Italian, Moroccan, Chinese, Brazilian, Japanese, Korean, Thai, French, and Indian. Before you leave town, be sure to try one of the city's many flavors: a soft pretzel, water ice, and a cheese steak or hoagie on a soft roll for a true taste of Philadelphia's hometown cuisine.

For College and University Hunters, did you know that 50 colleges and universities call Philadelphia home? According to the Greater Philadelphia Tourism and Marketing Corporation, the Philadelphia region is a world-renowned college town. About 220,000 of the best and brightest from around the world currently call Philly home, with some 60,000 students graduating from higher education each year. If you are planning to visit with your college-bound son or daughter, be sure to put Philadelphia at the top of your list and be sure not to forget your host institution, Chestnut Hill College! The beauty of CHC is bountiful, the technology is tremendous (see below), the academic activities are abundant, and the peace and prosperity are promising. We are going Co-Ed as well as housing the HAPS workshop. So the year 2003 will be a significant one for Chestnut Hill College!

Technology at Chestnut Hill College

The Academic Computer Center is located on the ground floor of St. Joseph Hall. Several lap top as well as both Macintosh and IBM-compatible computers are available. The Computer Center is equipped with the latest state-of-the-art software for courses in word processing, statistical analysis, graphics, desktop publication, database manipulation, web page editing, and web browsing over the Internet. Laser printers are available for high quality printed work both in black and white and in color. Academic Computing also maintains a software browsing library for students to borrow magazines, books, educational software, and camcorders, and tripods for various classes as needed.

The Academic Computer Center also manages three teaching labs, two for IBM-compatible PC's and one for Macintosh. The computer labs are available for classroom instruction ranging from computer software application basics to sophisticated programming languages. The computer labs are also available for use by faculty for Blackboard interaction and for the integration of technology in education.

The Devlin Video Production Suite in Martino Hall is an extension of the Computer Center and houses state-of-the-art video editing systems, a control room, labs, and a television production studio. The second and third floors of Martino Hall will be the primary sites for HAPS workshops. These floors each have tiered teletheaters that permit up to 50 students to participate in the latest teaching-learning environment. Several electronically "smart" classrooms are technologically wired to provide students and faculty direct access to the campus local area network, College (Login) Library, and the Internet. Mobile "smart" podiums provide instructors with the ability to use presentation technology similar to that found in the tiered teletheaters.

On behalf of my President, Carol Jean Vale, SSJ, Ph.D., William T. Walker, Ph.D., Vice President of Academic Affairs and Dean of the Faculty, and the entire college community, I welcome all of you to Philadelphia. Together we will make the HAPS 2003 Conference a successful one!
Pop quiz. Here are 50 cells, tissues, and organs. As you read, check off the ones that have cilia: 

- Papillary thyroid, parathyroid, or pterygoid gland; 
- The pancreatic exocrine cells, exocrine cells, or ductal epithelium; 
- Respiratory mucosa, gingival, ameloblasts, odontoblasts, or 
- Enteral epithelial; 
- Taste cells, olfactory cells, or vestibular hair cells; 
- Thymus or spleen; 
- The ovarian granulosa or theca interna cells; 
- The uterine tubes; 
- Endometrium, myometrium, or vaginal epithelium; 
- The Leydig cells, prostate, or seminal vesicles; 
- Epithelial cells, Schwann cells, or neurons; 
- The rods, cones, pigment epithelium, or ganglion cells of the retina; 
- The ciliary body, iris, cornea, or conjunctiva; 
- Chondrocytes or osteocytes; 
- Liver cells, cysic duct, or kidney tubules; 
- Mesothelium or endothelium; 
- Myocardium or smooth muscle; 
- Adipocytes or telont fibroblasts; and finally, 
- Epidermal keratinocytes or melanocytes. Count your checkmarks. If you have fewer than 30, I am sorry, you did not pass, but thank you for playing. If you have 30–50, give yourself a Dr. 35–39, C 40–44, B 45–49, A; and if you said all 50, you get an A+ and a 3-day weekend. Absolutely, the correct answer is all of these and more.

A year ago, I would have checked about 7 of these and failed the quiz. That was before a colleague called my attention to an article in BioPhotonic International on the “primary cilium” – a nonsensical ciliation that is usually solitary and shorter than most cilia (Leggett, 2001). More than a century ago, Leggett says, aristocrats were aware that a treatment of variety of cells possessed this “foreground organelle.” Nobody knew what to make of it, however, and the techniques for investigating its function did not exist until recently.

The peculiarity is evident in Bloom and Fawcett’s “Textbook of Histology.” Fawcett (1994, p. 30) called them “ abortive flagella,” presumably because they are solitary. He mentioned “a single very short flagellum, sometimes shorter than a cilium,” on many microvillous epithelial cells. Fawcett praised its lack of motility and its presence on cells that face no limbs, as in the antenates pterygoid and the pterygoid sphenes.

The function of most primary cilia is still unknown, but, employing techniques of laser-microbeam and confocal microscope, Helle Fracassini and Kenneth Spring, at the National Institutes of Health, have found a clue to their function in canine kidney tubules. The primary cilium in kidney tubules are usually 2 to 3 μm long, but in the collecting ducts of dogs, they range up to 50 μm and are relatively easy to manipulate. When the cilium is deflected about 3.5 μm by a micromanipulator or stimulated by a flowing fluid, the epithelial cell releases Ca2+ from its intracellular stores. The cytoplasmic Ca2+ concentration peaks in about 36 sec and returns above baseline by about 4.5 minutes. A calcium-binding fluorescent dye injected into the cell before stimulation grows with an intensity proportional to the rate of fluid flow over the cell surface. Glibalmin, a calcium chelating blocker, abolishes the response. In addition, the stimulated cell communicates with neighboring epithelial cells by a second messenger diffusing through gap junctions, and the calcium level in those cells rises even when they are not directly stimulated. This strongly suggests that the tubule epithelial cells act in unity as flow sensors (Pracassini and Spring, 2001).

Bower (1996) has an online database with a long list of cells with primary cilia in humans, other vertebrates, and invertebrates. He includes a bibliography of nearly 600 references. The American Society for Cell Biology, where initial reports of the primary cilium met with incredulity (Bower, pers. comm.), held a symposium on primary and sensory cilia a year ago (Retzius and Witman, 2001). Anatomy and physiology textbooks have been oblivious to the primary cilium. They give the impression that cilia are of very limited distribution, and that motility is the norm with nonmotile cilia being the exception. The introductory cyology chapters rarely mention any cilia other than those of the respiratory tract. But, other chapters mention little more than the micro cilium of the uterine tube and epididymis, and noneotroco sensory cilia of the inner ear olfactory epithelia, and retina. Perhaps it is time to inform our students that cilia are nearly everywhere we look, even in the unlikely seeking places such as keratinocytes and smooth muscle, as that researchers are beginning to shed light on the functions of some lesser-known examples.
Teaching is a demanding profession, with its share of weariness and toil. Not the least of the drudgery is grading exams, lab reports, and homework. Fortunately test and homework grading has its moments of levity, when a student so wildly misconceives a word that the answer takes on an entirely new and humorous meaning.

It happens at all levels, as in the story of a charming second-grade girl giving a show-and-tell presentation about the gestation and birth of her little brother, who reportedly spent nine months eating through an "umbrella card" until he was delivered by the "middle wife." But at the college level, we greet such malapropos with mixed feelings. On one level, we want to whoop with laughter and run to show the answer to our colleague in the office next-door. On another, we may realize that the way we pronounced a word in lecture could be taken in a way we did not intend. On a darker level, we may shake our heads in dismay at the unwillingness of students to study, and the seeming futility of our best efforts to cast pearls of erudition before an appreciative audience. Our laughter is not a laughter of derision, but often a laughter of desperation, frustration, and sadness.

We asked our colleagues on HAPPL to submit examples of amusing malapropos (a.k.a. "malapopota" or "amusingettes") from their A&P classes, and here is the collection. We bent the rules slightly to admit one malapoop by the contributor's husband, who was not trying to be funny but simply misunderstood a term, and to go a little beyond malapropos to the strict sense to include a few short essays that simply leave the instructor numb with disbelief.

Most of the annotations were by the contributors, but we took the liberty of adding a few. When contributors provided only the student's answer, we wrote a plausible question to set it up. Apparent spelling and punctuation errors in the answers should be construed as sic. Initials identify the HAPPL contributors with full names listed at the end. Many thanks to everyone who submitted these and brought tears of mirth to our eyes.

Chapter 1 stuff: Off to a bad start
Q: An anatomist who revolutionized medical illustration in the 16th century was.
A: Versailles. (KS) (So famous was his art, they named the Parian suburb after him.)
Q: Give an example of positive feedback.
A: The birth process, when the baby is extruded through the umbilicus.

Educational Issues - continued on page 8
HAPPL- Educator - Winter 2003 - page 7
Educational Issues - continued from page 7

A: Negator feedback is that a person is able to control himself. Which is he does not get hyper quickly therefore he does not have high blood pressure. For example if you are running and your pulse rate goes high, you can control by using negative feedback to calm you down. (KS) 

A2: The negative feedback loop goes through the process of reception, integration at a control center, and finally affectation. A signal is sent to the affecter which makes the appropriate changes. (KS)

Spiritual chemistry
Q: A given protein may have several structural varieties within a population. This is called...
A: protein polymorphism (RS) (Reminiscent of an animal behavior student who wrote of the Siamese fighting fish's 'aggressive behavior'.)

Q: If two amino acids were put together by dehydration synthesis, we would call the resulting chemical a (an)...
A: dipeptide (DE) (The two amino acids were bicarbonate and creatinine.)

Cyтовматematics
Q: Discuss the differences between mitosis and meiosis.
A: Mitosis is the multiplication of cells. Meiosis is the division of cells. Mitosis is used for human development. The multiplication of cells enables each organ to have a specific cell. Meiosis was used when there are 46 chromosomes each of the 2 would be 92 and that's too many so instead each stage Multiplying it 2 divides. (KS)

Q: concerning a mutation that causes excessive hair growth on the ear pinna? What is the phenotypic result of this mutation? A: hirsutus (RM)

Hysterical histology
Q: Define collagen.
A: A substance that is very important, it helps someone has been cut to return the wound as near as possible. (KS)

The skinny on dermatology
Q: The stratum corneum prevents...
A: defection (PB)

Q: Discuss the clinical issues in managements of extensive third-degree burns.
A: Bad infections (KS)

Q: Skin grafts (KS) (No doubt everybody has seen these malapropos at least a few times.)

Drew we suggest boning up a little more on the subject?
Q: What cranial bone lies between the frontal and occipital bones?
A: The temporal bone (TM)

Q: Identify the paired surfaces marked on a vertebra.
A: The superior articular facet (TM)

Q: What is the interior prominence where the two halves of the pelvis articulate?
A: The pubic symphysis (TM)

Little-known muscles
Q: The indwelling muscle under the chin is called the...
A: Mandidlo-Ayman muscle (KS)

No-brainers
Q: What is the function of the corpus callosum? Is it myelinated?

HAPS- Educator - Winter 2003 - page 8

A: To absorb urine or semen, to maintain stability of penis during sexual stimulation, it's unmyelinated. (TM)

Q: That part of the brainstem between the medulla oblongata and

A: pons (AM)

Making nonsense of the sense organs
Q: Throat infections can spread to the middle ear through the...
A: crista taeniae. (SB)

Q: The ear drum is also known as the...
A: timpanum (KS)

Q: In terms of the refraction of light, explain what causes myopia and hyperopia, what kinds of lenses correct these conditions and how they do so.
A: Glases with convexed lenses will cause the lens muscles to make the lens of the eye more convex so that the f到这里 will hit the optic disc. (KS)

A: Mypia (nearsightedness) the lens elongates, the lenses correct these condition by shortening the lens of the eye Hyperopia (farsightedness) the lens shortens, the lenses correct the vision impairments by long the lens of eye (KS)

A3: The type of lenses that are used to correct this condition would be a concave or one that makes the eye look slighter strectch. (KS)

Q: Explain how the uvula is able to distinguish high-pitched sounds from low-pitched ones.
A: When a loud sound is produced the oval window produces an excess amount of (CSF) cerebrospinal fluid that fluids up the scala vestibule and causes the basilar membrane to move in one direction more than the other; as the pitch gets lower the basilar membrane will be raised on both sides. I stay loud both sides will increase. (KS)

Q: What is the "blind spot" of the eye? What is an instance to when it would be beneficial to be aware of your blind spot?
A: A blind spot in our vision is where a small piece of an object is missing. This is beneficial because when you don't want to see something you can just stand in the distance to the object where it can be covered by the blind spot. (LB)

While evaluating special senses, a student reported that she has 20/20 hearing. (ED) (Not to mention the many who proudly declare, "I have 20/20 vision. Twenty in my right eye and 20/4 left")

Hormones
Q: Explain how steroid hormones (such as estrogen) differ from peptide hormones (such as insulin) with respect to the way they activate target cells.
A: Steroid hormones differ from polypeptide that steroid causes certain effects or changes in a person. Steroid can increase or decrease a person's physical features. In a polypeptide hormone, the polypeptide molecule does not change the physical appearance of a person but works on the one side of the organ (liver). (KS)

Circulatory arguments and fuzzy logic
Q: The first major trunk to come from the aortic arch is...
A: the brachiocephalic (TM)

Q: Determine the basic stages of circulatory shock and explain the physiological mechanism of each stage.
A: Anaphylactoid shock is due to circulatory shock. If the pet is shocked very suddenly, they are shown as anaphylactoid. (K2)

Q: Suppose a patient hemorrhages and her blood pressure drops. Explain what hormonal and neural mechanisms come into play to help restore normal blood pressure.

Educational Issues - continued on page 10
Educational Issues - continued from page 8
A: When blood pressure drops, temperature rises and estrogen is stimulated. Estrogen stimulates the hypothalamus of the brain to help control the thermoregulation of the blood pressure back to normal. (KS)
Q: Oncotic pressure is due mainly to RBCs and certain blood proteins called...
A: lipids (KS)

A limpking lymphatic answer
Q: The marked structure at the rear of the oral cavity is the...
A: parotid (T) (one of those p-words, anyway)
Answers that will leave you breathless
Q: Define dyspepsia.
A: Abdominal breathing and whistling. (KS)
Q: Describe the Heimlich maneuver:
A: You squeeze the belly and the air force pushes the object out. (RY)
Q: The maximum amount of air one can voluntarily inhale is the...
A: vital congestion (KS)

If you don’t know for sure, just go with your gut feeling
Q: Name the S-shaped portion of the large intestine distal to the descending colon.
A: The sigmoi (TM)
Q: Pancreatic__ is a starch-digesting enzyme.
A: duct (KS)

Metabolic dysfunctions
Q: Define renal diabetes.
A: The person who has sugar in kidney. (KS)
A2: The effect of sugar in the lower back part of the amys. (KS)
Q: Define pituitary diabetes.
A: Sugar in the hormone such as pituitary gland. (KS)
Q: List and define/describe the three methods by which the body loses heat.
A: In condensation the body loses heat by condensing the molecules of the body together. The molecules vibrate & vibrate about them. (KS)
Yet another student, contemplating her personal assessment, lamented her excessive body mass. She rationalized genetically that “My mother is fat, my father is fat...it must be in my genes.” (DD)

Urogenital confusion
“Blood vessels drain into the collecting ducts and flow down to the sertolos. The sertolos carry urine to the uterus and then the fluid is drained to the outside of the body, which is the urethral orifice.” (TM)

Irreproducible results
Q: The paired erectile tissues of the penis are called...
A1: the corpus callosum (EB)
A2: the corpora cavernosa (AM, MS, RF)
Q: The formation of male gametes is called...
A: spermatogenesis (PG)
Q: In spermatogenesis, a secondary spermatocyte divides into...
A1: oogocyte (RS)
A2: spermoids (KS)
Q: What is the function of the clitoris?
A: The function of the clitoris is to secrete into the hormones of the body and to function freely along the sides. (KS)
Q: Name the anterior mound of the vulva.
A: Mom’s pubes (Anon.)
Q: List and explain the hormonal and related physiological events in the stages of the human menstrual cycle.
A1: The human menstrual cycle usually start in 28 days, the days vary. (KS)
A2: While the cycle is taking place, blood from the uterus has the lining walls of the uterus in it. In other words, the lining of the uterus walls is expelled. (KS)
Q: Describe the actions of progesterone on cells of the endometrial glands in terms of the hormone, its receptor sites, and events in the target cell following the binding of the hormone to its receptor.
A: Action of progesterone will be at it will form on the uterine lining, its receptor site will be the ovary. The ovarian follicle will cause ovulation in the uterus to occur in the woman. Once the progesterone has blinded the ovary. It will cause ovulation to occur. (KS)

Ooh baby!
Q: Explain how genotype and hormones interact to control sexual differentiation of the human fetus.
A: The male chromosome genotype is XY, while the females chromosome genotype is XX. If they intersect, the result will be male less than that of the man. The man is more dominant than the woman. (KS)
A2: X male chromosome combine with Y female, girl X female chromosome combine with X female chromosome...they this happen only if Human Chromosome gonadotropin is in the present of testetin that is the testetin is present in great amount the child will develop as a male if testetin is not present the child will be female, female testetin trigger the genital to develop male character. That’s a female has to much testetin she could also have male character (KS)
Q: Define ecdyser.
A: The ecdyser is a gyms layer of tissue formed during morphogenetization. (RK)
Q: Define reemission.
A: If the baby has a blinded for life he is called reemission. (KS)
Q: Summarize the major physiological problems of a premature infant.
A: In the premature infant the avoiti has insufficient surfactant. They collapse with each ejaculation. This cause the tidal wave to be very low. This results in respiratory oxygen therapy causing the need for Chyme-Stroke effect. (KS)

Careers in the health sciences
Q: Define pathology.
A: The study of disease (BO) (For when you were knocking at death’s door, and the doctor pulled you through.)
Q: What is your career goal, and why did you choose it?
A: I want to be a doctor because I was a life that will never be monogamous. (NZ)

Contributors:
Anon. (from a bulletin board at the 1994 HAPOS conference); EB, Elizabeth Becker; LB, Laurie Bonnaure; PB, Pat Bowne; SB, Sheri Boyce; DD, Duane Dreyer; DE, David Evans; RF, Richard Fazzalari; PG, Pamela Gregory; AM, Alan Magid; JM, Harry McDonald, RM, Roberta Mehan; TM, Terry Mehan; KS, Ken Saladin; CS, Carl Shuster; BO, Betty Ott; MS, Muffie Slater; RY, Ruth Young; NZ, Nina Zanetti

HAPS-EDucator · Winter 2003 · page 9
Based on discussions on the HAPS listserve, I offer some tips for teaching muscle anatomy to allied health students in a two semester A&P course in a community college. In addition to a brief introduction in the laboratory that precedes the first muscle laboratory, I use three laboratory periods to teach muscles—two for cat dissection and one for computer dissection. Because the muscle dissection is our first cat dissection, I give a very long introduction discussing the value of dissection, the source and preparation of the cats, and my expectations of the students in doing dissection. I also take any questions and concerns the students have. (This takes 45 min.) Labs are 1 hr 30 min.

I teach approximately 40 human muscles, often pairs around a joint. The muscles are divided into two groups, upper and lower body muscles. In the introduction to the muscle labs, I describe how muscles are arranged around joints to produce motion and I assign homework that students must complete prior to each cat dissection lab. The homework is to find the origin, insertion, and action for the human muscles that we study. I stress the importance of reading through the actions for a muscle, and paraphrasing its major action since several students of copied text are too much to try to learn. I check to see that the homework is complete at the beginning of each cat dissection lab, but I do not collect it. During the cat dissection lab, students dissect a subset of the 40 muscles we are learning in the human—only the homologous ones that are really good on the cat. Students work in groups of three or four with two performing the dissection. I go from group to group (four groups/lab.) Sometimes I begin by having all the students gather around one cat. I teach them how to do blunt dissection and take away the scalpels that they have managed to find from my hidden stock. The students have a lab manual with good dissection instructions, and, once they get started, their dissections proceed nicely.

Dissection labs are the most exhausting labs that I teach. Students must show me the dissected cat muscles, and often I ask them to demonstrate an action by pulling on the muscle. The group reader, who is clean and dry, demonstrates the homologous human muscle on a torso or chart, and reviews the action of that muscle.

As they study cat muscles, students review the homologous human muscle.

The third lab is an instructor-led computer dissection of all 40 of the human muscles. We remove virtual layers until we can see the muscle of interest and, when appropriate, rotate the view so that students see the muscle from several surfaces. The rotation works particularly well for muscles like the latissimus dorsi and the gluteals. These are three or four students in a computer. We got around the room with each student taking a turn reading the origin, insertion, and action from the completed homework assignments. At this time we discuss a good phrase that describes the action of each muscle, and students can correct their homework. We also identify agonists, antagonists, and synergists for some of the movements. We demonstrate an action for each muscle we study. We pack up, wink, hex and extend against resistance; suck it out our guts, and stand on our toes. The computer dissection takes 1 full lab day and brings everything together.

On the lab practical exam for the muscle unit, students must identify human muscles on the torso or from illustrations of groups of muscles. They may also be asked for an action, antagonist, or synergist for some of the movements. We demonstrate an action for each muscle we study. We ask them to identify muscle origin and insertion, but I examine them on the concept by giving several origin/insertion sets and asking the students for an action of the muscle. These questions may include muscles that the students have studied or ones that they have not learned. They are all required to identify cat muscles.

Students have often thanked me for the long introduction to the use of animals as dissection specimens in the laboratory, as some even suggest in the course evaluation that each pair of students be given a cat so that everyone can have more dissection experience.

Thanks to my mentor and colleague, Jack Scott, from whom I learned the importance of linking each pair of students, and future teachers about the importance of dissecting muscles in such a way as to illustrate motion at a joint.

- Teaching Tips - continued on pag...
Many instructors incorporate different types of activities into their courses. These activities can provide diverse experiences for both student and instructor, as well as accommodate different learning styles and supplement the usual methods of evaluation (quizzes, exams, and practicals). Traditional morphology laboratories benefit from including alternative types of activities because normal lab exercises to these courses tend to be sedentary and observational, as compared to the active, experimental labs of a physiology or chemistry course.

I have developed a series of activities for a variety of undergraduate morphology courses for use in a single class session. These activities supplement traditional dissection and microscope work in such courses as Histology, Embryology, or Human Anatomy and Physiology. (In a later article, I will describe some long-term projects that can be used in these courses, in lieu of the traditional term paper.) These activities and my experience in using them were previously described in a workshop for the 2002 HAPS conference.

Initially, my motivation for developing alternative lab exercises was to improve the quality of time that students spent in morphology labs. In my earliest years of teaching, I was troubled by the contrast between my histology lab sessions and the microbiology lab being taught across the hall. In micro lab, the atmosphere was always lively, with students busily mixing reagents, transferring samples, sterilizing equipment, and otherwise energetically moving about performing experiments. In contrast, students in the histology lab sat quietly peering into their microscopes, seldom speaking, moving, or giving any indication of whether they were really engaged with the material. Not only did I have trouble determining the extent of their learning, but also the students themselves did poorly at assessing their own progress. For example, after taking a cursory look at the assigned slides, students would often declare, "I am finished; may I leave now?" In an attempt to remedy these problems and to enliven these labs, I developed some short exercises that could easily be incorporated into a 3-hour lab session without detracting significantly from the usual dissection or slide work. These new exercises were designed to achieve one or more of the following goals:

- to improve students’ focus and engagement by promoting physical activity and by providing tangible goals
- to provide students with means of self-assessment
- to accommodate different learning styles
- to encourage learning through interaction with others
- to provide practice in verbal communication of biology
- to encourage students to take “ownership” of material
- to introduce study strategies and to provide opportunity for practice in using them.

Short-term activities

The following section describes several activities that I now use in various morphology courses. These activities are not intended to replace standard lab work, such as looking at slides or dissecting preserved specimens, nor are they intended to replace the use of class lectures, but they are suggested as easily scheduled supplements to normal course activities.

Short-term in-lab exercises

1. Demonstrations Each student is instructed to set up a specific demonstration of a designated item studied during that day’s lab session. The demonstrations may involve using clay models, drawings, tracings of a microscopic image, a microscope set-up, or a labeled specimen. Typically, I assign items that are important but frequently overlooked or difficult to locate. When all students have finished setting up their assigned items the entire class moves around the lab stations observing the demonstrations. Sometimes students are asked to briefly describe their item to the class. This type of activity provides students with a tangible goal for the session, as well as an opportunity to practice verbal communication using morphological terms. Students who otherwise might lack focus will, at a minimum, become engaged in their topic because of their sense of ownership and responsibility to the class. Finally, this activity provides a way of ensuring that all students get to see some of the more difficult items to be learned during that week’s lab session.

2. Practice Practicals In this exercise, each student (or pair of students) is instructed to set up a lab practical station, complete with marked specimen and exam questions on a particular subject. I check the stations for accuracy and quality, assign with necessary adjustments, then have students move through the stations, answering the questions as though they were taking a practical. After completing the practicals, students check their answers and are given the opportunity to ask questions about troublesome items. If time permits, individual students may explain the-clues that they included to help lead to the correct answer. Practice practicals have been very popular with my students; they like having a non-
threatening way to assess their progress and to experience the process of taking a practical. In addition, this activity provides
many of the same advantages as the demonstrations in terms of
ownership, communication, and seeing difficult items. Finally, a
practice practical can provide a bit of physical exercise to wake
up students at the end of a lab session or whenever energy is
lagging.

3- Get-acquainted Party I use this exercise in a biodiversity
course, but it could be used for introducing any topic that involves
learning many new forms of items or categories. The actual exercise
can be done either in lab or in the classroom, but requires a
preparatory assignment in which each student is assigned a specific
topic to research. For example, for a Get Acquainted With the
Invertebrates Party, each student would be assigned to read about
a specific invertebrate phylum. On the day of the party, students
receive name-tags to designate their phylum (“Hello, my name is
nematoda”). Then they interview each other until they can
complete a chart with appropriate questions. (In this example, the
chart might list all invertebrate phyla in a column with other empty
columns for “type of symmetry,” “acoelomate/coelomate,”
“protostome/deuterostome,” etc.). This activity promotes
ownership of a particular topic, team effort, and practice in
communicating science. In my experience, students quickly learn
the new terminology as they are forced to say the terms repeatedly
during the class. This activity is lively and fun, and the instructor
will enjoy overhearing amusing conversations such as “Hi, I am a
cnidarian and live in the ocean, come help me!” Students will
appreciate refreshments. I use this exercise only rarely, but it can
provide a nice break while still serving a constructive educational
purpose.

4- Scavenger Hunt This assignment, in which students hunt
for a list of items, works well for turning a video showing into an
active exercise. For example, when I show students a video about
coral reefs, I ask them to list as many examples of different
invertebrate phyla as they can see, with points awarded for the
numbers and correctness of examples identified. The activity could
also work in a lab setting; for example, students might be given a
list of features related to the skeleton (names of specific bones,
bone categories, bone markings, etc.) that are to be searched for
on disarticulated skeletons set up around the lab. This exercise
provides opportunity for practicing communication with new
terminology, self-assessment, and the wake-up value of physical
activity.

Assigning the activities

Most of the activities described above are easy to integrate
into a lab or class session, and require relatively little preparation
on the part of the instructor, other than giving some thought to
how and when to present the assignments. For in-lab exercise
where each student is responsible for a different task, I usually
choose from a list of possible items (although an inviting
option often precipitates a stampede for the popular city on
exercise!). Alternatively, when assigning items for practice
practicals, I sometimes try so much the item to the teacher
abilities and progress, for example by assigning an exci-
challenging item to a student who has already mastered the ba-

Timing and time frame

Timing of these in-lab exercises is very flexible. The time
allowance can be as little as 15 minutes and can occur at any time
during the lab depending on the purpose of the activity. My students
enjoy having a three-hour lab broken into manageable bits, with
long periods of slide work on dissection interrupted by some
other type of exercise. Demotivation or scavenger hunts can be
scheduled to provide this type of break and an opportunity to
focus. Alternatively, practice practicals work well for review
the end of a lab period and are especially effective the week be-
as a scheduled practical. I rarely grade short in-lab exercises.

Benefits

The exercises and projects described above are example-
easy, inexpensive, and enjoyable ways of introducing diverse
learning activities into traditional morphology courses. While
intended as replacements for standard activities such as dissec-
tions and microscope observations, alternative in-lab exercises
promote student involvement, provide practice in communicating
skills and self-assessment, and accommodate different learning
styles. Many of the activities encourage students to develop a
sense of ownership for the material. Finally, these activities are useful
for the instructor because they often reveal abilities in students
that might not be obvious during standard class activities.

The next issue of the HAPS-Educator will include an article
novel activities that require more than a single class session.

Assistant/Associate Professor of Biological Sciences

The Department of Biological Sciences at the Louisiana State University in Shreveport invites applications for a tenure-track position
starting August 2003. The successful candidate is expected to have an earned Ph.D., to teach courses at the undergraduate and MS (Master's)
level, and to maintain an active research program that provides opportunities for undergraduate and graduate student experience in environmental, environmental sciences, or marine biology will be considered a plus. Letters of application stating it’s
interests, curriculum vitae, and three letters of reference should be sent to: Dr. Stephanie Amato, Chair, Dept. of Biological Sciences, Louisiana State University-Shreveport, One University Place, Shreveport, LA 71115-2301. For
please see website: http://www.lsus.edu/lschbios.

HAPS-Educator - Winter 2003 - page 12
Curriculum is what we teach, be it good, bad, well designed, intended, accidental, hidden, or otherwise. Most HAPS members probably start their courses with some type of introduction to anatomy and physiology. Following that introduction, however, the curriculum of their courses may differ greatly. For example, some instructors will spend the next five weeks on DNA, membrane composition, and other topics in molecular biology, while others skip over the molecular information and jump quickly into cells and tissues.

Being Co-Chairs of the HAPS Core Curriculum and Assessment Committee (CCAC), Chuck Wet and I receive requests for the "official HAPS curriculum" or some other type of authoritative statement on what should be taught in a human anatomy and physiology (A & P) course. At this time, however, we have little to offer. A new HAPS curriculum product, the learning outcomes database, has been under development, but we need help. The purpose of this article is to provide a brief history of the outcomes database, a rational for the project, a description of how learning outcomes can be used, and an explanation of how HAPS members can become involved.

Brief History
At the 1998 HAPS Conference, the CCAC initiated a project called "Curriculum 2000." The project was headed by Dan Lemons and Joe Griswold, who were then Co-Chairs of the committee. In the beginning, Curriculum 2000 attempted to collect and publish a large set of benchmarks related to human A & P. Chuck Wet joined the project a year later and convinced Dan and Joe to change their focus from benchmarks and learning objectives to learning outcomes. (To learn more about the difference between learning outcomes and learning objectives, see Chuck's article in this edition of the HAPS-Educator.) It was at the Charlotte Annual HAPS Convention in 2000 that the CCAC envisioned a goal of an on-line database for a large array of intended learning outcomes (ILOs). A sub-committee of the CCAC, the Outcomes Project Subcommittee, was formed and charged with developing a database of learning outcomes. One set of learning outcomes relating to the cardiovascular system was developed and put on-line in 2001 (http://www.gen.umn.edu/LearningOutcomesFrame.asp). At this time, learning outcomes for only one organ system have been created and the project has stalled. The reason for this lack of progress is linked to the tasks inherent in assembling the database. Specifically, the tasks of creating, editing, classifying, and posting just the first set of learning outcomes proved to be very labor intensive and well beyond the scope of typical volunteer work. In the spring of 2002, I wrote to NSF grant proposal to obtain funds to facilitate the publication of a comprehensive database of learning outcomes. Unfortunately, the proposal was rejected by NSF. Next spring, I hope to re-submit the proposal after considerable revision.

Why HAPS Needs A Curriculum Document
HAPS is the only organization of A & P instructors. Thus, it is understandable that people who teach A & P look to HAPS for guidance and help with issues ranging from animal use to curriculum matters. HAPS is an authoritative organization (i.e., an organization that sets standards which individuals and organizations can consult). The Learning Outcomes Project is a serious attempt to develop resources to help instructors and institutions in the following ways:

1. Planning curriculum
Try to remember back to the first time you taught an anatomy and physiology course. How did you know what to do first? How did you know how to write an exam? How did you know if your exams were any good? Did they test what you taught? (If you are a typical instructor, you simply did what was done to you when you were a student taking A & P, and you wrote tests that looked like the tests that you took as a student.) Intended learning outcomes are tools that can help teachers plan and organize their courses. For example, if during the first week of class an instructor wants students to learn the organization of the human body, he/she will be able to search the database for learning outcomes that are related to body organization. The instructor could then use this set of outcomes to begin constructing activities for the first week of class. As the database evolves, learning activities will be linked to the outcomes, and teachers will be able to choose which activities best fit the curricula of their course.

For experienced A & P instructors, the ILOs can be used to better teach difficult concepts or to insert new topics into their curriculum. For example, The Human Genome Project is a relatively new topic in biology, but what can A & P instructors do with such a large topic when it is not directly related to anatomy and physiology? An instructor can search the learning outcomes database to find content relating to human genetics and insert it into their course.
HAPS Committee Reports - continued from page 13
database for ILOs related to the Human Genome Project. If she
takes advantage of the ILOs that are appropriate to the course goals and
objectives, the instructor can then plan activities related to
achieving those learning outcomes.

2. Communicating curriculum
HAPS members teach in a wide variety of institutions ranging
from large research universities to community-based vocational
technical institutes. The ILOs will be useful to individuals in all
levels of A & P courses. For example, in allied health programs,
courses are required to play very specific roles in a broader
curricular plan with a well-defined goal. The A & P instructors
who teach first-year students in two-year nursing programs are
required to prepare their students for the more skill-based nursing
courses and also to begin preparing students for nursing board exams.
Instructors within these programs should meet to discuss
curricular matters such as how teachers teach, when it is taught,
how in-depth it should be, etc. Anatomy and physiology instructors
can present the ILOs they have initially selected for their course to
the instructional staff of a nursing program. After having
reviewed the ILOs, the nursing instructors say, "We would like
the students to know more about blood vessels and blood
pressure." The A & P and nursing staff could work together to
review and select the appropriate learning outcomes. The A & P
instructors would then use the revised set of ILOs to develop
activities to help students achieve the learning outcomes.

It is important to note here that the database of ILOs will be
huge; it will eventually contain thousands of items. It is extremely
unlikely that an A & P instructor will select every ILO. Instead,
individual instructors are more likely to select small subsets of
ILOs. The reason that HAPS needs such a large database is that
our members come from a wide array of programs—from one-
semester freshman level courses, to senior physiology courses.
The Learning Outcomes Database Project will be a tool that can
help all A & P instructors regardless of type of program in which
they teach.

Two of the more pivotal issues for HAPS members are the
large percentage of students who drop out of our courses and the
seemingly large number of students who dislike our courses.
Learning outcomes will NOT eliminate these issues, but they may
help retention and improve attitudes. Students frequently enter
our courses having a very naive conception of how much work
will be required. Students frequently think that college courses
will be easy; preparing for exams will only require an hour or two
per day. As a result, students experience some frustration when
they discover that an hour or two preparing for a test is grossly inadequate,
and the labs are long and complex, students' attitudes frequently falter
and many drop out. Communication is a key component to helping
students modify their initial naive conceptions, and intended learning outcomes can be used to improve communication between
instructors and students. Specifically, intended learning outcomes can
and should be posted in multiple venues, e.g., course syllabi, study
guides, lab manuals, etc. When introducing a topic, an instructor should state,
"Today we are addressing cardiovascular system learning outcomes 1, 2,
and 3." By clearly communicating the learning outcomes, the instructor is overtly informing the students of the expectations for
that day's activities—and students should have a clear understanding of what is expected in terms of their performance.
Students are then able to focus their study time around specific outcomes and will use their study time more efficiently, be better prepared for exams because they know what
specific topics will be on the exam, and maybe even formulate a
better attitude towards the course.

Unfortunately many of our students attempt to simply read the
book in an effort to prepare for exams, and after two or three
hours of reading a chapter or two, they frequently have learned
very little. Many students cannot effectively identify the main
points of a chapter, and sometimes the main points of the chapter are
different from the main points of the instructor. In addition
every few students can read a text and formulate a complete understanding of a topic. If this is too difficult. There are too many
different ideas, images, figures, tables, and words that are not ever
heard in everyday language. However, if their reading is organized via
ILOs, students should be able to read, and learn more efficiently.
Intended learning outcomes help students focus their limited time
and energy on the essential concepts and skills. For example, I
the syllabus, a student reads that one of the learning outcomes is
"Explain the difference between systolic and diastolic blood
pressure." The student will then look in the book, lab manuals,
or the study guide on CD-ROM, etc. for information germane to
this specific topic. A student should then ask themselves, "Can
I explain the difference between systolic and diastolic pressure?
" If so, he/she can check off that ILO and proceed to the next item.
Again, it is important to note that learning outcomes will not
eliminate student work, but they will help organize and direct
students to specific goals and make learning much more efficient.

An instructor could organize their entire course around
learning outcomes—possibly having five or even seven
learning outcomes for a two semester course. It would
probably be unwise to print all these learning outcomes in a
course syllabus, but they could easily be placed in a study guide or
even on a web-site. Either way, the learning outcomes should
be explicit and should help communicate expectations of the
course to the students.

3. Curriculum assessment
Writing a good test is not easy. How many test items should
be on blood pressure? How many should be on Starling's Law?
What type of test item should be used to assess student
understanding of concepts related to blood pressure? Multiple
choice? Essay? Test writing is a creative process that sometimes
goes well and other times does not. Most of it can remain the
student's domain and the confident feelings we had when we were
well-prepared for a big exam only to discover that the exam
seemed to be written by a teacher from another course, or may
even another planet. Learning outcomes can help exam writers in
validating exams. When an instructor writes an exam, he/she
should, and should target the ILOs of the instructional unit for which
the exam is being constructed. For every ILO, there should
be test item, too maybe two or three or four depending on if
importance placed on that item. Conversely, if students do not
receive ILOs related to Starling's Law, the test should not contain
related items to Starling's Law. This seems like common sense
but too often students are faced with a test that covers "Chapter
9, 10, and 11" and in those chapters are 3 or 4 paragraphs
Starling's law; how much time should a student spend study
that topic? If ILOs are used, students can focus on the essential
concepts and skills, and prepare accordingly. What happens
without ILOs is that many entry-level students, who are not
anatomy majors and that, and new to preparing for large exams
do not realize that Starling's law is part of the cardiovascular
system—it just blends into the fog of Chapters 9, 10, and

HAPS Committee Reports - continued on page
HAPS Committee Reports - continued from page 14

Good teachers, of course, have always communicated key concepts and topics within chapters, prior to students' attempts to prepare for exams. The use of ILOs will help make this communication more efficient and understandable.

A logical next step to the development of the learning outcomes database would be to incorporate test items associated with each ILO. Instructors could then select test items designed to target the specific ILOs. However, we must first focus on establishing the initial learning outcomes database.

What HAPS members can do to help:

National Science Foundations grants are very difficult to secure. Past experience shows that when an organization rallies around a proposal, its chances of getting funded are greatly increased. In the following weeks I will be revising and posting the narrative portion of the HAPS Learning Outcomes Project proposal on the following Website: (http://www.gen.umn.edu/ faculty_staff/jensen/HAPS/)

That site contains a link to the learning outcomes database for the cardiovascular system, a copy of last year's proposals, and the reviewers' comments. Here is what we need from you:

1. HAPS members should first learn about learning outcomes. (Reading Chuck Wett's accompanying article is a great start.) To see examples of how ILOs are written, members could review those related to the cardiovascular system that we posted on the HAPS Website.

2. Think about how you could use this database. Would you use it to plan your curriculum, to communicate to students what will be done in your courses, to design tests, etc.? If you already use ILOs, consider submitting a case study or two on how you use case studies within your courses to the HAPS Learning Outcomes Project.

3. Think about writing a letter of support for the proposal (which will be submitted in May 2004). In addition to letters of support from the HAPS Board of Directors, we need letters from people who teach in different programs. Especially powerful would be letters from groups of instructors teaching in allied health professions (e.g., A&P instructors and nursing instructors), stating that the ILOs could help the coordination and implementation of curriculum within those programs.

4. Members can volunteer to critique the proposal. They can volunteer to be a part of the team required to generate ILOs and assemble the database. Some of the key pieces are already in place, but there is much more to be done. Consequently, much more help is needed.

The learning outcomes database is the largest curriculum project ever attempted by HAPS. It is important to note that this is not an attempt to tell people what to teach, but rather a large collection of items that will assist instructors in organizing and implementing the curriculum of their courses. Please think carefully about helping with this project; we need help!

If you have any questions, please feel free to e-mail me at (jensen005@umn.edu.)

Human Anatomy Instructor
Biological & Physical Sciences Department

The College is currently seeking a Human Anatomy Instructor to work in our Biological & Physical Sciences department. This instructor will teach courses in Human Anatomy and Biology and must have experience with cadaver dissection. This is a full-time, tenure track position.

Qualified candidates must have Master's degree in Biology and Human Anatomy or related field; a Ph.D. and previous college teaching experience at a community college level is preferred.

The College offers an excellent benefit package, including fee waivers and tuition reimbursement. Interested applicants should apply in person or send a résumé to:

Columbus State Community College
Attn.: Human Resources Department
550 E. Spring Street (Rhodes Hall)
Columbus, Ohio 43215-1786
614-287-5341 (fax)
www.cscc.edu
EOE

HAPS Committee Reports - continued on page 16
HAPS-EDucator - Winter 2003 - page 15
Learning Outcomes Statements

Charles R. Wess, Co-Chair of the HAPS Core Curriculum and Assessment Committee (CCAC)
4647 Shortridge St. S.E.
Albany, OR 97321-6402
(541) 924-9374
cwess@pdx.edu

At the 2000 Annual HAPS Conference in Chantilly, NC, the Core Curriculum Assessment Committee (CCAC) embarked on a pilot project to develop a searchable database of intended learning outcomes (ILOs) for the cardiovascular system. The database was designed to include the following setch parameters: clinical domain, cognitive type, organ system, outcomes type, structural level, and learning outcomes. By mid-January, 2001, the prototype database was officially open to viewing by the HAPS membership. Later in 2001, the HAPS Board of Directors charged the CCAC with developing intended learning outcomes for every human organ system. The long-term goals of the project include: encouraging instructors to develop their A&P curricula in a more deliberate manner; helping instructors effectively communicate to students the competencies they must achieve to be successful in their A&P courses; and helping instructors develop assessment instruments that more realistically evaluate students’ knowledge and abilities. The database ILOs are not intended to be prescriptive, but are intended to be a rich resource from which instructors can draw to aid in developing competency-based curricula. However, before instructors can effectively use ILOs they must have clear understanding of these instructional/learning tools.

In recent years, I have witnessed considerable confusion among educators over the nature of learning outcomes and instructional objectives. Consequently, I have been concerned that this confusion may be impeding efforts to curriculum improvement, such as those proposed by the HAPS CCAC. Specifically, this ambiguity (and the consequent debates surrounding the meanings of the aforementioned terms) may be causing some instructors to be reluctant to adopt a learning outcomes-based curriculum design. This article is an effort to remove some of that confusion and to promote the realization of CCAC goals of curriculum improvement.

The following is an in-depth summary of the nature of learning outcomes:

“Learning outcomes are statements that describe the significant and essential learning (knowledge, skills, and attitudes/values/dispositions) that the learners have achieved and can reliably demonstrate at the end of a program or course. Learning outcomes describe the culminating and verified demonstration of learning and achievement at the end of the learning process.”

They should reflect the range of types of learning (i.e., learning related to cognitive, affective, and psychomotor domains) and levels of learning, as described in Bloom’s Taxonomy of Educational Objectives. This can be accomplished by using the proper verbs in constructing learning outcomes. The following are descriptions and examples of Types of learning:

- Unended Institutional Outcomes: Definition—outcomes that reflect the overall effectiveness of an institution’s departaments and divisions; effectiveness should be validated by objective evidence. Example—“Increase the retention and success of students.”

Program Outcomes:
Definition—the intended results of a program of study, appropriate to the rigor and breadth of the degree or certificate awarded.
Rationale—Students and potential students need to know the expectations of a program and the criteria by which they will be assessed. Such knowledge should reduce the risk of students choosing unsuitable programs because of incomplete information or misconceptions about a program’s aims and content. Knowledge of program expectations and assessments criteria should also increase student motivation and enhance student performance.
Characteristics—Program outcomes should assist students both prior to entry and prior to leaving. Highlighting the achievements that result from completion of a program may facilitate students in choosing a career. Program outcomes could act as a useful starting point for curricula wise (CVs), job applications, interviews, and portfolio development. Program outcomes should help in the articulation of students’ abilities.

“Program outcomes should include knowledge, understanding and skills that are acquired cumulatively throughout the programme. Programme outcomes must include statements of personal transferable skills, (sic) or key skills.”

The key skills are universally considered to be the following:
- Communication
- Numeracy
- Information technology
- Working with others
- Improving own learning and performance
- Problem solving.

Example—Students completing the baccalaureate program in Psychology will compare favorably with their knowledge of the field.

Course Learning Outcomes:
Definition—The minimum outcomes intended for student attainment and competence.
Characteristics—They may and should be enhanced by each college depending upon local need, business and industry standards, occupational requirements.

Example—The overall objectives (below) should be attained by the end of the series of practicals and are what you should be able to do. They are to:
- Name and describe, in standard terms, anatomical plane and relations and the gross anatomical components of the body and explains their function.
HAPS Committee Reports - continued from page 16

- Describe the location of functional systems in the regions of the body.
- Demonstrate anatomical skills, in particular be able to point out surface markings of internal organs and structures and explain their significance.
- Begin to identify the spectrum of usual variation of normal human structure and function and how this relates to abnormality.
- Explain the two dimensional projection of structures on radiographic images.
- Work as part of a team towards stated objectives.
- Develop problem solving, essay writing and IT skills.**

Intended Learning Outcomes (ILOs):

**Definition:**-instructional objectives that focus on 'the types of performance' (i.e., cognitive or affective skills) students are expected to exhibit as a result of a given learning experience. More pragmatically, ILOs "specify what behavior a student must demonstrate or perform in order for a teacher to infer that learning took place." **Rationale:**-The advantage of ILOs is that they clarify the intent of instruction and provide a basis for assessment of student learning. They reinforce the notion that learning experiences are not ends in themselves but means to ends—the intended learning outcomes.**

**Characteristics:**-Intended learning outcomes, as types of specific instructional objectives, have four components:

- **audience—**defines the learners for whom the objective is written.
- **behavior—**describes the actual behavior students will exhibit as a result of instruction;
- **condition—**describes the conditions under which students are expected to exhibit the desired behavior (e.g., circumstances, commands, materials, and directions); and
- **criteria—**establishes the quality of performance that is expected.**

**Example—**Given a human skeleton, the student will correctly identify by labeling at least 40 of the following bones: (list of bones inserted here).**

The comprising parts of this ILO are:

- **audience—**learners enrolled in the course
- **condition—**Given a human skeleton
- **behavior—**the student will correctly identify by labeling
- **criteria—**at least 40 of the following bones: (list of bones)

Good ILOs have three distinguishing characteristics:

1. The specified action by the learners must be observable.
2. The specified action by the learners must be measurable.
3. The specified action must be done by the learners.**

The following are some examples of ILOs for the cardiovascular system, taken from the Human Anatomy & Physiology Society database:**

\[ \text{"Explain how each of the cause-and-effect relationships involved in the sequence of events that occur during cardiac muscle cell contraction contributes to maintaining normal cardiovascular function." This learning outcome deals with the cognitive domain at the level of comprehension.} \]

\[ \text{"Explain why it is vital that blood typing precede a blood transfusion." This learning outcome deals with the cognitive domain at the level of comprehension.} \]

\[ \text{"Explain why it is more dangerous to cut an artery than a vein." This learning outcome deals with the cognitive domain at the level of application.} \]

Why would a teacher choose ILOs? Intended learning outcomes clarify the intent of instruction for both the instructor and the student, and they provide a basis for assessment of student learning.** Specific ILOs should be chosen based on how they support the course learning outcomes.

How would an instructor use ILOs in his/her class? Intended learning outcomes can assist curriculum planners, teaching staff, students, and those responsible for articulation. By identifying the ILOs of a course, curriculum planners can develop appropriate learning experiences to match the ILO types (i.e., cognitive, affective, and psychomotorial) of outcomes. Awareness of the course ILOs will assist instructors in:

- designing their materials more effectively by acting as a template for them;
- selecting the appropriate learning experiences (e.g., lectures, seminars, learner self-paced, or laboratory exercises) that match the intended outcomes;
- communicating to their colleagues what a particular activity is designed to achieve;
- setting examinations based on the materials delivered;
- designing and implementing appropriate assessment devices and procedures; and,
- communicating more effectively to their colleagues what a particular activity is designed to achieve.**

(For the epistemologists reading this article, I readily concede that assessment is more than determining to what extent students learn; assessment also involves looking at students’ experiences. However, the scope of the Learning Outcomes Project has been limited to promoting an instructional strategy that can significantly improve learning (assessment of learning). Finally, ILOs help students learn more effectively by helping students focus their time and energy more efficiently. In addition, student stress is lower when they know specifically what is expected of them.

I hope the preceding discussion has removed some of the confusion surrounding ILOs and will serve to encourage the use on learning outcomes in curriculum development.

REFERENCES


The annual process of identifying candidates for the 2003 HAPS election is underway. The Nominating Committee, which consists of Phil Tate (chair), Kevin Patton, Richard Faircloth, and Susan Baxley, will be assembling a slate of top candidates to fill each of the offices that have terms ending on July 1, 2003. These are President-Elect, Secretary, Southern Regional Director, and Central Regional Director. The following operating principles will guide the Nominating Committee in its work:

- A maximum of two candidates will be nominated for the position of President-Elect. This ensures that whoever is elected is supported by a majority of those members who vote. The maximum number of candidates for offices other than President-Elect has been set at three.
- Members of the Nominating Committee will select candidate recommendations from other HAPS members. You are invited to submit your own name to the Nominating Committee on or before March 1, 2003, in order to be considered for nomination.
- The Nominating Committee will compile a list of possible candidates for each office and prioritize the lists according to criteria approved by the HAPS Board of Directors. The criteria include the following:
  1) years of HAPS membership,
  2) committee participation and/or leadership,
  3) current or previous elected or appointed positions,
  4) attendance at regional and/or national conferences,
  5) presentations made at regional and/or national conferences,
  6) other special work for HAPS, and
  7) evidence of support from the home institution.
- After a list of potential candidates has been compiled and prioritized, each candidate will be approached individually to determine his or her willingness to run for a specific office.
- All discussions of potential candidates will remain confidential within the Nominating Committee.
- In late March or early April, all members of HAPS will receive brief biographies of the candidates along with ballots on which to indicate their choices. Write-in candidates are acceptable at the time of balloting. However, if you choose to enter a write-in vote for someone other than yourself, it is requested that you obtain the candidate's approval before doing so. All ballots are to be submitted directly to the national office where they will be counted by one of the staff. It will be my pleasure to announce the results of the voting during the annual business meeting at the HAPS 2003 Conference in Philadelphia.

Description of the offices to be filled in the 2003 elections:

President-Elect: The office of President-Elect actually involves a three-year commitment (first as President-Elect, then President, and finally Past-President). The year-long training period of the President-Elect includes a position on the Board of Directors and ensures a smooth transition to the presidency the following year. The President-Elect works closely with the President and is privy to all of the decision making and much of the correspondence in which the President engages. During the training year, the President-Elect is responsible for chairing the Nominating Committee for the next election.

Secretary: The Secretary is responsible for notifying the membership of all general meetings and for keeping minutes of all general, Board of Directors, and Steering Committee meetings. The Secretary also maintains HAPS records and sends out communications to members to the appropriate individual. The Secretary is a voting member of the Board of Directors. The term of office for this position is two years with the opportunity to be re-elected for one additional consecutive term.

Regional Directors: The Regional Directors are elected by the entire membership and exist to ensure that there will be individuals from across the continent serving on the Board of Directors. Each Regional Director is responsible for communicating with his/her constituents via small group meetings and written communications. They also serve as members of the Regional Conference Committee to promote local/regional conferences in their respective areas. Regional Directors are responsible for support and communication with various HAPS committees assigned to them. The term of office for this position is two years with the opportunity to be re-elected for one additional consecutive term. The positions up for election this year are the Southern and Central Regional Directors.
By the time you read this, we will have had two HAPS Regional Conventions in the year 2002. Daniel Olson of Northern Illinois University had his conference April 27, 2002. There were about 50 attendees who were treated to information on cardiovascular physiology, forensics, medical illustration, and a swing session for idiots and "hands-on" activities. This was held in conjunction with CAAPS (Chicago Area A&P Society).

On October 19, 2002 there was a conference at Anne Arundel Community College in Maryland hosted by Javanka Mody. They had over 80 attendees getting updates on two separate topics, multiple sclerosis and the Human Genome Project. In addition there were 8 different workshop topics to choose from, along with food and door prizes. Eight exhibitors helped round out the conference with their products. Sponsors provided medals, tote bags, and conference facilities for the attendees. There were rave reviews from the conference participants.

Several HAPS members have volunteered to host conferences in their respective areas. Mary Lou Bareither will have her conference at the University of Illinois at Chicago Saturday, March 1, 2003. Tom Lehman of Morgan Community College in Colorado has mentioned a date of March 23 & 24, 2003. The focus of the Colorado Regional Convention will be technology in the classroom. Dawn Balmer of George Brown College in Ontario is tentatively planning a June 19 & 20, 2003, conference.

Other HAPS Regional conferences are in the planning stages, but respective dates have not been chosen. Terry Lee in Kansas has mentioned a date of Fall 2003. Gene Wright in Virginia might consider hosting a conference in the fall 2003 or spring of 2004. Laney Mobley in Kilgore, Texas, had her arm twisted to consider a conference for January or February of 2004. There are others I have contacted and they will let me know, so continue to check the HAPS web site (www.hapsweb.org) or contact me for information.

As you can see, we are trying to reach out to the members. People would like to see more conferences in their local areas. Some cannot attend the national conventions and would like to get updates in their teaching fields. What better way than to have one in your area. We need more local conferences.

Will you help by considering hosting a conference? Your first step is to contact your administration for approval. Then set a date and select your committee. Complete the proposal form (see below) and mail it to me. Do not wait. We need HAPS Regional Conferences for Fall 2003 and Spring 2004.

Proposal for a Regional Conference

Name of Conference Coordinator

Coordinator’s Address

Phone Number

Proposed Site/Host Institution

Proposed Date(s)

Please supply the following information on separate sheets of paper:
- Outline of Proposed Budget (see Budget section of Guide for Coordinators of HAPS Local Conferences
- Written statement of administrative support/approval from the host institution agreeing to co-sponsor the HAPS Regional Conference and to allow use of its facilities
- Request for seed money, if needed (see HAPS Report in Guide)
- List of 3-digit zip codes (first 3 digits) for areas to be included in mailings (usually not more than a 250-mile radius)

Send a copy to:
Mary Bracken
see above address

HAPS-EDucator - Winter 2003 - page 20
HAPS 2003 Western Regional Conference

Morgan Community College is planning to host the HAPS 2003 Western Regional Conference on March 23—24 in Colorado. The theme of this two-day conference will be “Instructional Technology,” presenting a variety of demonstrations and hands-on workshops in using some of the latest technologies available for scientific education.

- **Guest speakers** will include Vic Spitzer, Director of the Center for Human Simulation, demonstrating the “Visible Human Dissector” and Peter Jeschownig, faculty member at Colorado Mountain College, who will share with us his experiences in creating at-home lab kits for science courses.
- **Hands-on workshops** will include the clay Manikin (that funky skeleton you saw me dragging around the last two conferences) and the SMART Board (an interactive dry-erase board that acts like a computer monitor).
- We’re scheduling the conference during March, to allow attendees the chance to spend a few extra days enjoying Colorado (“Come for the Conference, Stay for a Vacation!”).


Email: Tom.Lehman@mcc.cccoes.edu if you might be interested in attending this conference. I need to get an idea of a headcount to make arrangements and determine expenses and fees. Thanks.

**Thomas P. Lehman**
Morgan Community College
17800 County Road 20
Fort Morgan, CO 80701
800- 622-0216 x3211
970-867-3082 Fax
Tom.Lehman@mcc.cccoes.edu
www.mcc.cccoes.edu
On March 22, 2002 at 12:15 in the afternoon, six ambitious HAPS members embarked on a journey that took them to a crisp morning in October later that year. On the Broadneck Peninsula, situated between the Chesapeake Bay, Magothy, and Severn Rivers, the trees outside of the CADE Fine Arts Center of Anne Arundel Community College had started to turn crimson and yellow. Inside, all were busy preparing for the arrival of the more than 80 participants for HAPS 2002. The speakers, workshops, panels, and vendors were all ready. The bags with logos and folders had been stuffed; name badges had been alphabetized; the audiovisuals were in place; the meals had been prepared; and all signs were in place.

At the end of the day, we looked back on the events that had occurred. A beautiful spread of pastries, bagels, and fruit, plus coffee and tea started the evening. Dr. Marty Smith, President of the college, had given an uplifting welcome to the teacher and student participants. She stressed that today would be a learning day for all, and she was so pleased to see many teachers and students who had come from far away and had given up a free Saturday. Dean Trish Casey-White, Dean of Learning Advancement, talked of the wonderful professional development activities provided by HAPS over the last decade. She showed us some of the HAPS memorabilia that decorate her office— from T-shirts, to Masai coconuts, to lumber mugs. Dr. Michael Glasgow, President of HAPS, gave a welcome and introduced Elizabeth Harper, our Regional Director, and Gail Jenkins, Treasurer of HAPS. Michael then introduced our keynote speaker, Dr. Hardshad Mody, Director of Neurology, Harbor Hospital, Baltimore, Maryland. Dr. Mody’s talk was “Multiple Sclerosis: Immunological and Clinical Perspectives.” His talk was extremely well received and provided us with much current clinical and therapeutic information, as well as an historical perspective dating back to the 1800’s.

Later, workshops on pedagogy, technology, and anatomy and physiology were presented in two breakout sessions with four workshops each. All were well received.

A great hot lunch included Greek salad, chicken with peppers, onions and tomatoes over seasoned rice, corn, and peppers, plus incredible desserts with lots of chocolate, strawberries, and lemon bars. There were opportunities for good conversation and networking as we visited our vendor participants following lunch and before we participated in another set of workshops.

At 5 pm, we all reassembled in our large meeting room for our well-received panel discussion on “The Human Genome Project: Implications for the Future.” With the publication of the draft of the human genome map, we began to understand the nature of our genome and its importance in shaping human attributes. The panel described the science behind the human genome project and also explored the psychosocial, ethical, and legal issues generated by this new knowledge. Implications for the future of nutrition were also explored. Panel members included Anne Arundel faculty from the fields of marine biology, nutrition, psychology, and law. The lawyer, who has a concentration in reproductive technology law, ended the discussion with many new questions for us to ponder in this brave new world.

The last events of the day were our wrap up, evaluation, and door prizes. And what wonderful prizes they were—books on MRI and CAT Scan images for anatomists, anatomy books, physiology books, CD’s on anatomy and physiology, tickets for live performances on campus, mugs, pen sets, and a Palmy Pilot.

Special thanks go to Benjamin Cummings Publishers and John Wiley and Sons Publishers for their support. We are also grateful to the American Association of Anatomists; Biopac Systems, Inc.; DXR Development Group, Inc.; McGraw-Hill Publishers; Olyympus America Inc.; S.E.G.; as well as other donors of door prizes and services; Robert Smoos, The College of Southern Maryland; Richard Faircloth; Anne Arundel Community College’s Administration; the Office Goddesses of Science, Alice Gillis, Debbie Triple, Jackie Byrne, and Michele Kerr; the AACCC Conference Planning Office, Gloria Lightbiter and Susan Haybeck; and Mary Bracken of HAPS, the Chair of the Regional Conference Committee for the entire HAPS organization.

It takes a committee to “do” a conference. Our committee for the HAPS Regional Conference @ Anne Arundel Community College: Javanka Novy, Chair, Richard Faircloth, Ewa Gorski, Judith Osbourn, JoAnne Settel, Carol Veil, and Debra Bartlett.
Assistant/Associate Professor
Cell/Molecular Biologist

Texas Woman’s University invites applications for two tenure-track faculty positions in the Department of Biology. Areas of interest include neuroscience, cell signaling, gene expression, and related fields that may complement current research and teaching areas. Successful candidates will teach undergraduate and/or graduate courses, and supervise training of M.S. and Ph.D. students. A Ph.D. degree, postdoctoral experience, research productivity, and the potential to develop an extramurally funded research program are expected. TWU, a comprehensive public university, is a teaching and research institution enrolling approximately 8,500 undergraduate and graduate students.

Submit a letter of application, curriculum vitae, a brief description of current research interests, teaching experience, philosophy of teaching, and three letters of reference to:

Faculty Search Committee
Department of Biology
P.O. Box 425799
Denton, Texas 76204
E-mail: wruillv@twu.edu.
Web site: www.twu.edu/obiol/

Review of applications will begin immediately and continue until positions are filled. AA/EOE.

Please note that even though it says biology/cell/molecular, the faculty member will most likely end up teaching anatomy and physiology courses.

HAPS-EDucator - Winter 2003 - page 23
Greetings to everyone. I could not decide what to call this follow-up article on my experiences as the HAPS 2002 Conference Coordinator. There are so many possibilities, all of which apply. Should it be afterglow, afterimage, afterlife, aftermath, aftertaste, aftermath, afterwards, or afterward? So I settled on "After."

After reflection, I know that being Conference Coordinator was a tremendous experience, one I highly recommend. (This is a not-so-subtle call for volunteers for future Conference Coordinators.) Speaking for everyone involved with the planning and conducting of the conference, the pleasure of the guests is the pleasure of the hosts. We hope everyone really enjoyed the conference in Phoenix.

One after pleasure of the conference was the establishment of an in perpetuity endowment at Phoenix College. If a conference shows a profit, part of the profit becomes a gift to the hosting institution, to be used to further anatomy and physiology education. On behalf of HAPS, I was privileged to present a $5,000.00 gift for an academic scholarship fund. It will be used to pay the tuition and fees for the best first-semester anatomy and physiology students to continue their second-semester anatomy and physiology education at Phoenix College.

There is no such word as afterweather, but there should be. All you 2002 Conference attendees came to Phoenix expecting it to be hot. Fortunately for the non-acclimatized, the weather was very pleasant. But after you left, we had the hottest summer on record with an average temperature of 94.8 degrees Fahrenheit. There were 115-days with a high of 100 or more, and 28 days with a high of 110 or higher. So how hot was it really? It was so hot that cows gave evaporated milk and the farmers had to feed their chickens crushed ice to keep them from laying hard-boiled eggs. What a summer!

Dr. Phil Tate recently presented Phoenix College President, Dr. Corina Gardea (right), a check for $5,000, which will fund human anatomy and physiology academic scholarships.
Pat earned a “Certificate in Online Teaching” in 1998 and has continued to take classes to improve her online teaching skills. She was awarded the Distinguished Faculty Award at her institution in 2001. I mention these items as a form of introduction because “Piddlin’ Pete” was an animated PowerPoint presentation about the latest advances in diabetic research. Leslie Sarony wrote the poem on which the title is based.

Not only were the differences between type I and type II diabetes mellitus explained, but emphasis was placed on the fact that diabetes is a systemic disease which can lead to blindness and kidney disease as well as heightening the risk factors for stroke and cardiovascular disease. Management systems such as diet and insulin injections cannot cure diabetes; this can only be accomplished through finding a source of new islet cells. Transplantation procedures can involve an entire pancreas or only the islet cells. The Edmonton Protocol for islet cell transplantation was explored. Research is also being done to transplant genetically engineered beta cells, and stem cell research offers promise for the future. Numerous web sites and journal articles were cited in the bibliography.

At the Annual HAPS Conference in Phoenix, I attended a presentation on Misconceptions by Harold Modell and Joel Michael that was enlightening because their comments made me rethink some old ways of teacher-student communication. A study was discussed concerning physics students who were given a pretest on the physical laws of our world, and who then attended a terrific physics class, followed by a posttest. The results of the test showed that the students had the same misconceptions about physics after the class that they had before the class.

What Modell and Michael kept stressing was that students do not learn because of what instructors tell them, but that they already have mental models of how things work, whether that model is of physics or, in the case of our students, physiology. The presenters stated that many fitter misconceptions were symptoms of a faulty mental model. The way we learn is to build mental models; we keep a model until it breaks, then we can rebuild all or part of it. Modell and Michael suggested that our role as instructors is to ask students why they think what they think in order to find errors in their mental model. We can determine what the conceptual or reasoning difficulty is only AFTER we have figured out WHY they think what they think. Then, once we have figured out what their mental model is, the way to fix it is to make them through mini-steps or little questions by having them make predictions using their mental model to see if it holds up or breaks down. Modell and Michael kept emphasizing that students know things and the way to clear up misconceptions is to have them test their mental models by PREDICTION, then let them TEST the model. Through this process, they can rebuild their mental models and clear away misconceptions.

HAPS 2002 - continued from page 26
HAPS-EdCaucator - Winter 2003 - page 25
Session 1 at the Annual HAPS Convention in Phoenix was an interesting and very informative session describing an important teaching initiative of the American Physiological Society (APS) called the Archive of Teaching Resources. The Archive, a web site sponsored by APS (http://www.aparchive.org), is a fantastic repository of many different types of physiology teaching resources. The web site is a searchable database of case histories, test questions, lectures, animations, and web links which can be used to enhance and supplement physiology education. The material is grouped into three different education levels, K-12, undergraduate and graduate/professional, so there is something of interest for any group you teach. The Archive contains not only material developed by the APS through its numerous educational programs, but also a significant amount of material submitted by individual educators from all fields of physiology. In fact, the APS encourages submission from any educator who would like to share any of his or her educational resources with the rest of us. The authors retain copyright to any material they post on the site and have free access to revise or update their material at any time. All of the material selected for inclusion in the Archive is peer reviewed for accuracy by a fifteen-member scientific review panel. Since the Archive is envisioned as a site for colleagues to share information and teaching resources, there is a feedback mechanism in the form of a bulletin board attached to each submission. Authors receive comments about the material they have posted along with a usefulness rating from the users of the site. While this is a free service provided by the APS, registration is required to view the various materials on the site. Since part of this initiative has been funded by a grant from the National Science Foundation, the amount of usage of the site is being tracked to monitor the effectiveness of the project.

The APS Archive is actually part of an even larger digital library project sponsored by the NSF and AAAS involving 13 different professional societies and coalitions for biology education called the BioSciEd Net (BEN) Collaborative. While each individual society, including APS, collects and maintains its own archive of teaching materials and resources, all of the databases from each group are digitally linked. Therefore, if someone from any of these organizations can be used to provide access to the resources of the BEN consortium providing tremendous potential for advancing not only physiology but all of biology education at every level. I strongly urge all HAPS members to utilize this resource and, if at all possible, share your teaching expertise with the rest of your colleagues.

For further information about the APS Archive of Teaching Resources or BEN contact Melinda Lowy, the coordinator of the higher education program for APS, at mlowy@the-aps.org or by telephone at (301) 634-7787.

Summary of Workshop 301

Critical Thinking: If It Is So Important, Why Don’t We Teach It?

Dayton J. Find Ph.D.
Biology/Pharmaceutical Sciences
St. Louis College of Pharmacy
4558 Parkview Place
St. Louis, MO 63110
(314) 367-8700 X307
dfind@stlcop.edu

Whenever I look at the learning objectives (or course outcomes) for a course, I am amazed at the number of courses that are teaching critical thinking. After careful investigation however, I find that these courses do not actually teach critical thinking as a process or a skill, they simply expect that students will develop or sharpen their critical thinking skills during the semester (or year). As we all know, our students have very poor critical thinking skills, even after several courses that have critical thinking as a course outcome or objective.

In this workshop, I gave several definitions for critical thinking explained two of the most common ways in which critical thinking is taught, and then we discussed how we can incorporate more critical thinking exercises into the courses that we teach.

There are as many definitions for the term "critical thinking as there are stars in the sky (obviously an exaggeration, but you get the point). My personal favorite (because it is clear and

HAPS 2002 - continued on page
conceivably is this: critical thinking is the ability to generate an
informed opinion about an issue, after considering both the
evidence for AND against, and then form a clear and logical
argument to defend that opinion. Pretty simple? How many of
us give our students the opportunity to practice this type of
skill? After all, critical thinking is a skill like any other that
needs to be practiced in order to achieve proficiency. We cannot
expect that students will pick this up as we go along, just as we
do not expect students to just pick up the
ability to calculate exam clearance as we
go along. Any skill (and critical thinking
is no exception here) needs to be practiced
in order to become proficient.

The two most popular ways to teach
critical thinking contrivances of one that does
not require very much additional work
and is done by the instructor, and one that
is very labor intensive. The simplest way
to give your students practice in critical
thinking is to use a workbook, puzzle
manual, or exercises that they can do on
their own (outside of class). This is
especially helpful for instructors that
teach courses in which it is difficult to
incorporate exercises that teach both
content and critical thinking (anatomy)
and for instructors that simply do not have
the time to either write or grade any more
exercises for their courses. The more
labor-intensive method requires that
students write evaluations of articles
(either in scientific journals or even
science articles in popular magazines), in
which they take a stand on the issue being
discussed in the article and defend it.
Obviously the first few assignments
turned in will not be very good for several
reasons:

1) this may be the first time that these
students have been expected to
think critically
2) your students’ writing is likely to be
very bad
3) they are not used to having to cite
evidence for an opinion (these
days simply having an opinion
seems to be enough)
4) students often resist new
ideas. This method also has the
added benefit of improving
your students’ writing skills.

Incorporating critical thinking
exercises into your course (no matter
which method you choose to use) requires
an additional time commitment from both
the instructor and the student. This means
that the workload on both the instructor
and the student will increase unless there
is a reduction in content. Those who are unwilling and/or unable to
reduce their course content in order to incorporate more critical
thinking exercises into their courses may wish to use the easier
method of student workbook exercises. If, however, you are serious
about teaching your students, both how to be better critical thinkers
and to be better writers, then the more labor intensive method
utilizing writing exercises is the best method to use. The reduction
in content that may accompany adoption of this method is more
than made up for by the quality of students that are produced by
using this method of teaching.
Do You Teach ...  
**Human Anatomy and/or Physiology?**

Do you want to ...  
- Update your expertise in human biology?  
- Improve your teaching techniques?  
- Sample the latest technologies for teachers?  
- Visit with authors and publishers of major A&P (and other human biology) texts?  
- Expand your network of friends and colleagues?  
- Experience the most enjoyable and most productive meeting you have ever attended?

**About HAPS ...**

The Human Anatomy and Physiology Society (HAPS) was founded in 1987 to promote communication among teachers of human anatomy and physiology in colleges, universities, and related institutions; to present workshops and conferences (both local and national); and to encourage educational research and publication by HAPS members.  

HAPS has over 1,000 members from two-year and four-year colleges and universities throughout the United States and Canada.  

HAPS members are committed to quality teaching. The annual HAPS conferences (which now attract over 300 participants), regional conferences, and HAPS publications provide members with opportunities for updating their knowledge, improving technical skills, investigating new technologies for laboratory and classroom, and networking with their peers.

**Update Seminars**

Experts provide updates on selected human anatomy and physiology topics, the latest developments in medicine, and the application of current educational research to the classroom.

**Conference Workshops**

Workshops presented by A&P educators and other experts will offer demonstrations and hands-on learning of practical tips, techniques, and other applications appropriate to human biology courses.
The following committee chairs list is input from HAPS members and willingly provide information on the activities of their committees.

ANNUAL CONFERENCE COMMITTEE
Heide Borchert, Chair
School of Health Sciences
Bemidji State University
205 Hamster Boulevard
Bemidji, MN 56601
(218) 755-7509
heide.borchert@bemidjistate.edu

The primary responsibility of this committee is the development of a manuscript evaluation structure for the annual conference, formulation of guidelines and assistance for the conforming coordinator, and generation of a calendar of other conference sites.

CORE CURRICULUM AND ASSESSMENT COMMITTEE
Murry Jensen, Chair
General College
University of Minnesota
128 Hennepin Street
Minneapolis, MN 55455
(612) 627-1417
murry.jensen@umn.edu

The primary responsibility of this committee is the development of a manuscript evaluation structure for the core curriculum, formulation of guidelines and assistance for the conforming coordinator, and generation of a calendar of other conference sites.

GRANTS AND SCHOLARSHIPS COMMITTEE
Richard Paulsen, Chair
Sage College Community College
101 College Parkway
Bemidji, MN 56601
(218) 755-7509
richard.paulsen@bemidjistate.edu

The primary responsibility of this committee is the development of a manuscript evaluation structure for the grants and scholarships, the selection of proposals/awards, and submission of recommendations to the Board of Directors for approval.

MEMBERSHIP DEVELOPMENT COMMITTEE
Donna White, Chair
Math and Natural Science
Collin County Community College
2000 E. Spring Creek Parkway
Plano, TX 75094
(972) 881-3149
(214) 255-2109

donna.white@cctc.edu

Committee members assist the Chair in recruiting members and compiling membership information.

NOMINATING COMMITTEE
Philip Tung, Chair
Department of Biology
California State University
202 W. Thomas Road
Phoenix, AZ 85004
(602) 284-1300
(602) 284-7220
phil.tung@asu.edu

e-mail is always the current President-Elect. The committee is responsible for recruiting nominees for the elected offices and appraising positions of the HAPS organization.

PRESIDENTS EMERITI ADVISORY BOARD
William Perrott (Past-President, Iaconis College;
Life Science Department
Mohawk Valley Community College
1100 Merriment Drive
Utica, NY 13501
(315) 792-5519
(315) 792-5566

govert@mvcc.edu

This is an experienced advisory group that includes all who have served as Past Presidents of HAPS. It provides advice as requested by, and with a voice of HAPS' memory to the deliberations of the Board of Directors.

PUBLICATIONS BOARD
Cole Whaley, Chair
Nutrition & Physiology
McKee-Beshel Pathology
1222 Sausalito Road
Madison, WI 53711
(608) 277-7319
(608) 277-7311
cole_whaley@octagon-hill.com

HAPS-EDUCATOR ADVISORY PANEL
(co-subcommitte)
Susan Barley, Chair
College of Arts and Sciences
Troy State University-Montgomery
231 Montgomery Street
Montgomery, AL 36104
(334) 241-5873
(334) 241-8665

shelley@tsu.edu

Members of the HAPS-Educator Advisory Panel provide advocacy and support services to the HAPS-Educator editor such as soliciting and reviewing articles, and proofreading the final draft of the HAPS-Educator before it goes to press.

EDITORS: HAPS-Educator
See information above

HAPS Web Page
Murry Jensen
General College
University of Minnesota
128 Hennepin Street
Minneapolis, MN 55455
(612) 627-1417
(612) 626-7048
murry.jensen@umn.edu

Biology Department
University of Minnesota
128 Hennepin Street
Minneapolis, MN 55455
(612) 625-4903
(612) 626-6784
murry.jensen@umn.edu

The committee monitors and reports on technological changes in anatomy and physiology teaching, such as advances in instructional software and diagnostic equipment.

THEMATIC COMMITTEE
James A. Poston, Chair
College of Arts and Sciences
Troy State University-Montgomery
231 Montgomery Street
Montgomery, AL 36104
(334) 241-5873
(334) 241-8665

shelley@tsu.edu

The committee monitors and reports on technological changes in anatomy and physiology teaching, such as advances in instructional software and diagnostic equipment.

TESTING COMMITTEE
John Thompson
Math and Science
Leesona County Community College
430 North Abbe Road
Elkton, OH 43065
(419) 396-7745
(419) 396-3462

Biology Department
University of Minnesota
128 Hennepin Street
Minneapolis, MN 55455
(612) 625-4903
(612) 626-6784
murry.jensen@umn.edu

The committee monitors and reports on technological changes in anatomy and physiology teaching, such as advances in instructional software and diagnostic equipment.

CONFERENCE COORDINATORS
2000 E. Spring Creek Parkway
Bemidji, MN 56601
(218) 755-7509

The committee monitors and reports on technological changes in anatomy and physiology teaching, such as advances in instructional software and diagnostic equipment.

Dobrin, Ryan
Department of Biological Sciences
Mount Royal College
4223 Richard Road SW
Calgary, Alberta T2E 8N6
Canada
(403) 424-6173
(403) 424-6005

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A HAPS COMMITTEES AND BOARDS
Human Anatomy & Physiology Society
8000 Bonhomme, Suite 412
St. Louis, MO 63105

Address Service Requested

lullad
SUSAN
ARTS 4 1
231 MCR
MONTGO